39. (Original) The method of claim 37 wherein a first pair of carrier wavelengths, λi and λj, are changed to a second pair of carrier wavelengths, λk and λl, wherein $(\lambda k-\lambda i)/(\lambda k+\lambda i)>1$.

40. (Original) The method of claim 37 wherein said changing comprises changing in a random manner.

41. (Original) The method of claim 37 wherein said changing comprises changing in a programmed manner.

42. (Original) The method of claim 37 wherein said encoding comprises embedding control bits in the information for communicating future changes in the carrier wavelengths to a receiver.

REMARKS

Claims 1, 2, 3, 23, 26, 29, 30, 31, and 33 are rejected under 35 U.S.C. section 102(e) as being anticipated by U.S. Patent No. 6,714,724 to Hayee et al. ("Hayee").

Claim 4 is rejected under 35 U.S.C. Section 103(a) as being unpatentable over Hayee in view of U.S. Patent No. 4,442,528 to Fukuda ("Fukuda").

Claims 5-8, 27, 32, 34, and 35 are rejected under 35 U.S.C. Section 103(a) as being unpatentable over Hayee, in view of U. S. Patent No. 6,204,810 B1 to Smith ("Smith").

Claims 9-13, 21, 22, 24, 25, and 36 are rejected under 35 U.S.C. Section 103(a) as being unpatentable over Hayee.

Claims 14-20 and 37-42 are rejected under 35 U.S.C. Section 103(a) as being unpatentable over Hayee in view of U.S. Patent No. 6,072,994 to Phillips et al. ("Phillips").

Claim 28 is rejected under 35 U.S.C. Section 103(a) as being unpatentable over U.S. Patent No. 5,608,722 to Miller ("Miller") in view of Hayee.

Claims 1-42 are pending.

Rejection of Claims 1, 2, 3, 23, 26, 29, 30, 31, and 33 under 35 U.S.C. Section 102(e)

The Office Action indicates that Hayee teaches a free space (col. 1, line 17) optical communication system (Fig. 2) and method comprising a transmitter (element 201) configured to encode and transmit over free space, information in at least two discrete optical carrier signals (Col. 1, Lines 25-29 and Col. 4, Lines 14-21); and a receiver (element 205) configured to receive and decode the information from said discrete optical carrier signals (Col. 1, Line 41 and Col. 4, Lines 37-47).

Applicant has amended claims 1 and 29 to more particularly point out and distinctly claim the invention. Claims 1 and 29 have been amended to recite that information is encoded in a first optical carrier signal, and the inverse of the information is encoded in a second optical carrier signal.

The present invention, as recited in the amended claim 1, is directed to a free-space optical communication system including a transmitter and a receiver. The transmitter is configured to encode and transmit information over free-space. The information is encoded in a first optical carrier signal, and the inverse of the information is encoded in a second optical carrier signal. The receiver is configured to receive and decode the information from the first optical carrier signal and the inverse of the information from the second optical carrier signal. Support for this amendment can be found, at least, on Page 5, Lines 9-18 of the Specification, and in Fig. 2.

The present invention, as recited in amended claim 29, is directed to method for free space communication of information. The method includes encoding the information into a first

optical carrier signal and encoding the inverse of the information into a second optical carrier signal. The method further includes transmitting the first and the second encoded optical carrier signals, receiving the first and the second encoded optical carrier signals, and decoding the information from the first optical carrier signals and decoding the inverse of the information from the second optical carrier signal. Support for this amendment can be found, at least, on Page 5, Lines 9-18 of the Specification, and in Fig. 2.

In contrast, Hayee teaches polarization-division multiplexing ("PDM") to use different states of polarization in a single optical carrier at a transmitting terminal, to multiplex different channels of data to produce a PDM signal for transmission. The respective receiving terminal decodes the received PDM signal, without demultiplexing, to separate the different states of polarization, to extract the different channels of data. Such a PDM signal at one carrier wavelength may be multiplexed with one or more other PDM signals at different carrier wavelengths in a WDM or DWDM system (Col 1, Lines 37-48). Nowhere does Hayee teach or suggest information being encoded in a first optical carrier signal, and the inverse of the information being encoded in a second optical carrier signal.

In view of the foregoing, it is respectfully submitted that Hayee does not teach or suggest the subject matter recited in claims 1 and 29. Specifically, Hayee fails to teach or suggest, at least, information being encoded in a first optical carrier signal, and the inverse of the information being encoded in a second optical carrier signal.

Claims 2, 3, 23, 26, 30, 31, and 33, which depend directly or indirectly from the independent claims 1 and 29, incorporate all of the limitations of claim 1 or 29 and are therefore patentably distinct over Hayee for at least those reasons provided for claims 1 and 29.

Rejection of Claim 4 under 35 U.S.C. Section 103(a)

As previously discussed, Hayee does not teach or suggest the subject matter recited in claim 1. Specifically, Hayee fails to teach or suggest, at least, information being encoded in a first optical carrier signal, and the inverse of the information being encoded in a second optical carrier signal.

The Office Action states that Hayee fails to show a transmitter being configured to communicate a logical 1 by transmitting a positive amplitude optical pulse at a first carrier wavelength and to communicate a logical 0 by transmitting a positive amplitude optical pulse at a second carrier wavelength. The Office Action further states that Fukuda discloses that either logical level 0 and/or level 1 can be configured to communicated by transmitting a positive optical pulse of the carrier signal.

Fukuda teaches the principle of a pulse communication method in which a transmission data signal a is converted into a CMI code c and thereafter modulated into a 3-level CMI signal g and transmitted by the signal transmission line. On the reception side, the received signal is demodulated separately into the data signal and the clock signal (Col. 2, Lines 33-40).

Fukuda does not teach or suggest the invention recited in claim 1. Specifically, Fukuda fails to teach or suggest, at least, information being encoded in a first optical carrier signal, and the inverse of the information being encoded in a second optical carrier signal.

In view of the foregoing, it is respectfully submitted that Hayee and Fukuda, whether taken alone or in combination, do not teach or suggest the subject matter recited in claim 1, as each of these references fails at least to teach or suggest, information being encoded in a first optical carrier signal, and the inverse of the information being encoded in a second optical carrier signal.

Claim 4, which depends directly or indirectly from the independent claims 1, incorporates all of the limitations claim 1 and is therefore patentably distinct over Hayee in view of Fukuda for at least those reasons provided for claim 1.

Rejection of Claims 5-8, 27, 32, 34, and 35 under 35 U.S.C. Section 103(a)

As previously discussed, Hayee does not teach or suggest the subject matter recited in claim 1. Specifically, Hayee fails to teach or suggest, at least, information being encoded in a first optical carrier signal, and the inverse of the information being encoded in a second optical carrier signal.

Smith teaches a communications system in which a communications channel is defined at least in part by an electromagnetic wave having a carrier frequency and an electric field vector. The extremity of the electric field vector traces a non-linear periodic path at a second frequency between the carrier frequency and zero from the perspective of an observer looking into the axis of propagation of the wave. The transmitter of the communications system launches a wave having such characteristics and modulated with information in a suitable manner. The receiver of the communications system is sensitive to the periodic path and second frequency. Either the periodic path, the second frequency, or both provide selectivity that can be used to define multiple communications channels (Abstract).

Smith does not teach or suggest the invention recited in claim 1. Specifically, Smith fails to teach or suggest, at least, information being encoded in a first optical carrier signal, and the inverse of the information being encoded in a second optical carrier signal.

In view of the foregoing, it is respectfully submitted that Hayee and Smith, whether taken alone or in combination, do not teach or suggest the subject matter recited in claim 1, as each of

these references fails at least to teach or suggest, information being encoded in a first optical carrier signal, and the inverse of the information being encoded in a second optical carrier signal.

Claims 5-8 and 27, which depend directly or indirectly from the independent claims 1, incorporate all of the limitations claim 1 and is therefore patentably distinct over Hayee in view of Smith for at least those reasons provided for claim 1.

Independent claim 29 recites similar features as claim 1, and therefore is patentably distinct over Hayee in view of Smith for at least the reasons discussed in connection with claim 1. Claims 32, 34, and 35, which depend directly or indirectly from the independent claim 29, incorporate all of the limitations of claim 29 and are therefore patentably distinct over Hayee in view of Smith for at least those reasons provided for claim 1.

Rejection of Claims 9-13, 21, 22, 24, 25, and 36 under 35 U.S.C. Section 103(a)

Claim 9-13, 21, 22, 24, 25, and 36, which depend directly or indirectly from the independent claims 1 and 29, incorporate all of the limitations of the corresponding independent claims, and are therefore patentably distinct over Hayee for at least those reasons provided for claims 1 and 29.

Rejection of Claims 14-20 and 37-42 under 35 U.S.C. Section 103(a)

As previously discussed, Hayee does not teach or suggest the subject matter recited in claim 1. Specifically, Hayee fails to teach or suggest, at least, information being encoded in a first optical carrier signal, and the inverse of the information being encoded in a second optical carrier signal.

The Office Action states that while Hayee does not clearly show a transmitter configured to change a carrier wavelength of each of said at least two discrete optical carrier signals, Phillips shows the frequency (wavelength) to be configured to change.

Phillips teaches a system that partitions or divides the functions of a radio into channels and divides the functions of each channel into two major functions: antenna interface and power amplification; and hardwired mixing, modulation/demodulation and signal processing. The system further partitions the mixing through signal processing functions into the functions of programmable analog mixing and programmable digital modulation/demodulation and signal processing (Abstract).

Phillips does not teach or suggest the invention recited in claim 1. Specifically, Phillips fails to teach or suggest, at least, information being encoded in a first optical carrier signal, and the inverse of the information being encoded in a second optical carrier signal.

In view of the foregoing, it is respectfully submitted that Hayee and Phillips, whether taken alone or in combination, do not teach or suggest the subject matter recited in claim 1, as each of these references fails at least to teach or suggest, information being encoded in a first optical carrier signal, and the inverse of the information being encoded in a second optical carrier signal.

Claims 14-20, which depend directly or indirectly from the independent claims 1, incorporate all of the limitations claim 1 and are therefore patentably distinct over Hayee in view of Phillips for at least those reasons provided for claim 1.

Independent claim 29 recites similar features as claim 1, and therefore is patentably distinct over Hayee in view of Phillips for at least the reasons discussed in connection with claim 1. Claims 37-42, which depend directly or indirectly from the independent claim 29, incorporate

all of the limitations of claim 29 and are therefore also patentably distinct over Hayee in view of Phillips for at least those reasons provided for claim 1.

Rejection of Claim 28 under 35 U.S.C. Section 103(a)

The Office Action states that Miller discloses a wavelength modulated communication system comprising: multiple transmitters (fig. 1); multiple receivers; multiple user (ports) (elements 26, 28), each including at least one of said multiple receivers; and multiple hubs (elements 22, 24) (Col. 7, Lines 7-8), each configured for transmitting and receiving data with at least two of said multiple user ports (Cols. 8-10); multiple repeaters (elements 14, 16, 18, 20) each configured to receive, amplify, and route the optical signal to at least one member of the group consisting of other repeaters, hubs and user ports. The Office Action further states while Miller fails to show a transmitter configured to encode information into at least two discrete optical carrier signals, Hayee discloses a transmitter to be configured to encode information into at least two discrete optical carrier signals (Col. 1, Lines 49-56), and a receiver to be configured to receive and decode the information from said at least two discrete optical signals (Col 1, Lines 56-62).

Applicant has amended claim 28 to more particularly point out and distinctly claim the invention. Claim 28 has been amended to recite that information is encoded in a first optical carrier signal, and the inverse of the information is encoded in a second optical carrier signal.

The present invention, as recited in the amended claim 28, is directed to a wavelength modulated optical communication based fiberless optical communication system. The system includes a plurality of transmitters where each of the plurality of transmitters is configured to encode information into a first optical carrier signal and encode the inverse of the information

into a second optical carrier signal. The system further includes a plurality of receivers where each of the plurality of receivers is configured to receive and decode the information from the first optical carrier signal-and the inverse of the information from the second optical carrier signal. The system further includes a plurality of user ports where each of the plurality of user ports includes at least one of the plurality of receivers. The system still further includes a plurality of hubs where each of the plurality of hubs is configured for transmitting and receiving data with at least two of the plurality of user ports. The system yet further includes a plurality of repeaters where each of the plurality of repeaters is configured to receive, amplify, and route the first and the second optical carrier signals to at least one member of the group consisting of other repeaters, hubs, and user ports. Support for this amendment can be found, at least, on Page 5, Lines 9-18 of the Specification, and in Fig. 2.

In contrast, Miller teaches a signal processing architecture for base stations and gateways used in spread spectrum multiple access communication systems. A digital receiver and demodulation scheme is employed that makes more efficient use of available signal bus capacity. The method and apparatus of Miller's invention converts communication signals received by each of a series of receivers to digital form and then demodulates each of the signals to remove outer PN codes and compute signal data energy metrics for the data being transferred to all system users on each of several frequencies. The data metrics for each intended user within each received signal are then transferred to signal decoders and diversity combiners assigned to individual communication circuits or recipients (Col. 5, Lines 61-67 to Col. 6, Lines 1-7).

Miller does not teach or suggest the invention recited in claim 28. Specifically, Miller fails to teach or suggest, at least, information being encoded in a first optical carrier signal, and the inverse of the information being encoded in a second optical carrier signal.

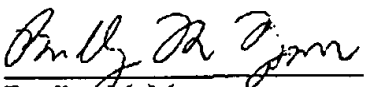
Hayee, which has been discussed above, also does not teach or suggest the subject matter recited in claim 28. Specifically, Hayee fails to teach or suggest, at least, information being encoded in a first optical carrier signal, and the inverse of the information being encoded in a second optical carrier signal.

In view of the foregoing, it is respectfully submitted that Miller and Hayee, whether taken alone or in combination, do not teach or suggest the subject matter recited in claim 28, as each of these references fails at least to teach or suggest, information being encoded in a first optical carrier signal, and the inverse of the information being encoded in a second optical carrier signal.

Conclusion

In view of the foregoing, applicants respectfully request reconsideration, withdrawal of all rejections, and allowance of all pending claims in due course.

Respectfully submitted,



Bradley M. Marazas
Reg. No. 51,997

September 9, 2004
Reveo, Inc.
85 Executive Blvd.
Elmsford, NY 10523
914-798-7403